

Replacement of RTI Display Unit to NAV in Volvo (RTI CD Early models)

REV. 1.5 (Another way of doing it, see the end of the document)

(This will work both for the small and the wide Display)

Video can be seen on: <http://www.nasab.com/Volvo/tip-trick.htm> where we have put up some video from our test and the last one which is a final working Standard Navigation in Volvo RTI unit.

(Final edition together with NAV Voice Guide over TV tuner)

First of all everything depends on how much you want to spend both in money and time (When we refer to cost we do not consider NAV unit only the cost for some electronic parts, connectors and cables):

1. You can make the replacement very easy and cheap by just take out the RTI Display and replace it mechanically with a TOMTOM, Garmin or Lark NAV which has 4.3 inch Display and use a switch to operate the Up/Down and to turn the NAV On/Off. This is the simplest way of doing it.
2. You can use a sophisticated pc board with microprocessor to communicate with the can bus and by then you would be able to operate the RTI Up/Down with the original keys on the steering wheel or by the remote control. This is very complicated and difficult solutions and expensive and you need to have know how, how to programming microprocessors and not very easy for the common person to achieve. In this way you also have to mechanically replace the RTI display with some kind of NAV.

Our Project

3. **Our NAV have Dimensions:** 295.6 x 204 x 7.95 millimeters and that is max what you can use in Volvo with the small Display. (Measured outside the NAV). And remember features like back camera, video etc. depends on what kind of NAV you buy.

This way you replace the RTI mechanically and use some of the feature which is original in the RTI electronics. We will in detail show this method as we think it would be the most suitable way of replace the Volvo RTI with some kind of NAV where almost everybody can do it as long as they have some kind of mechanical and electronically knowledge and it do not cost more than between 10 to 50 Euro in material. We choose this way where you do not need any programming and still have some features which operate the RTI Display/NAV Up/down starts the NAV automatically when the RTI goes "Up" and shuts down the NAV when the RTI goes "Down". You can also use the original buttons on the steering wheel or the remote control for sending the RTI Up/Down, but nothing else.

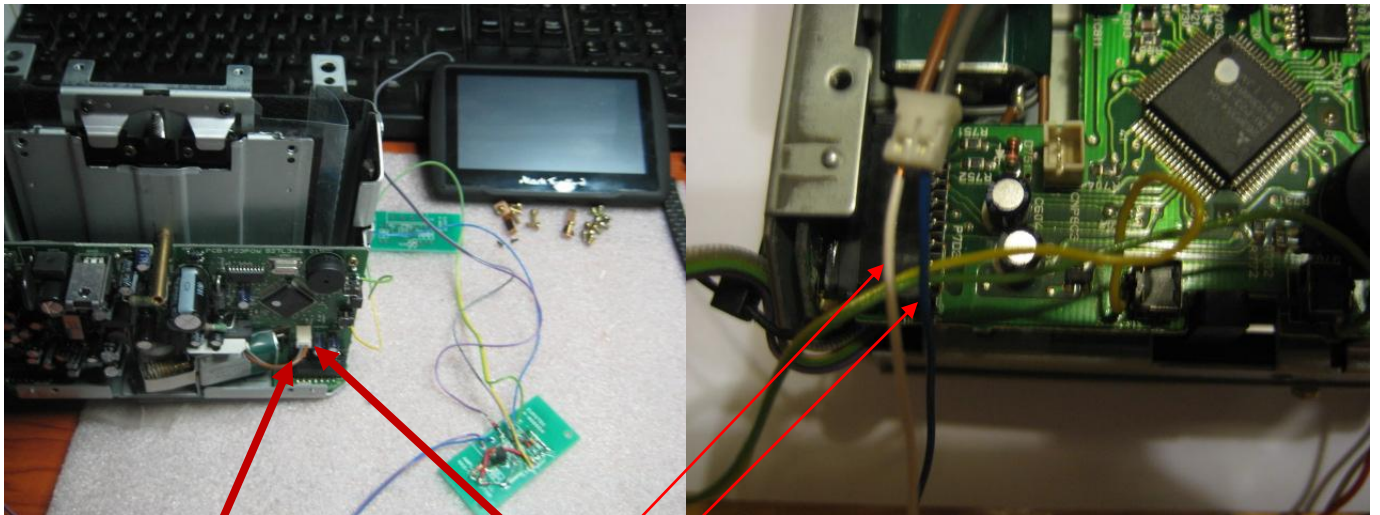


We will start to show how you disassemble the RTI Display.

1. First take out the complete unit from the car.
2. Take away the plastic cover over the RTI unit and the speaker.

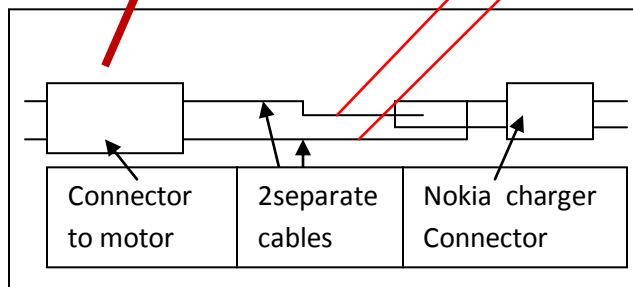


Take away the cover on the back of the RTI unit.

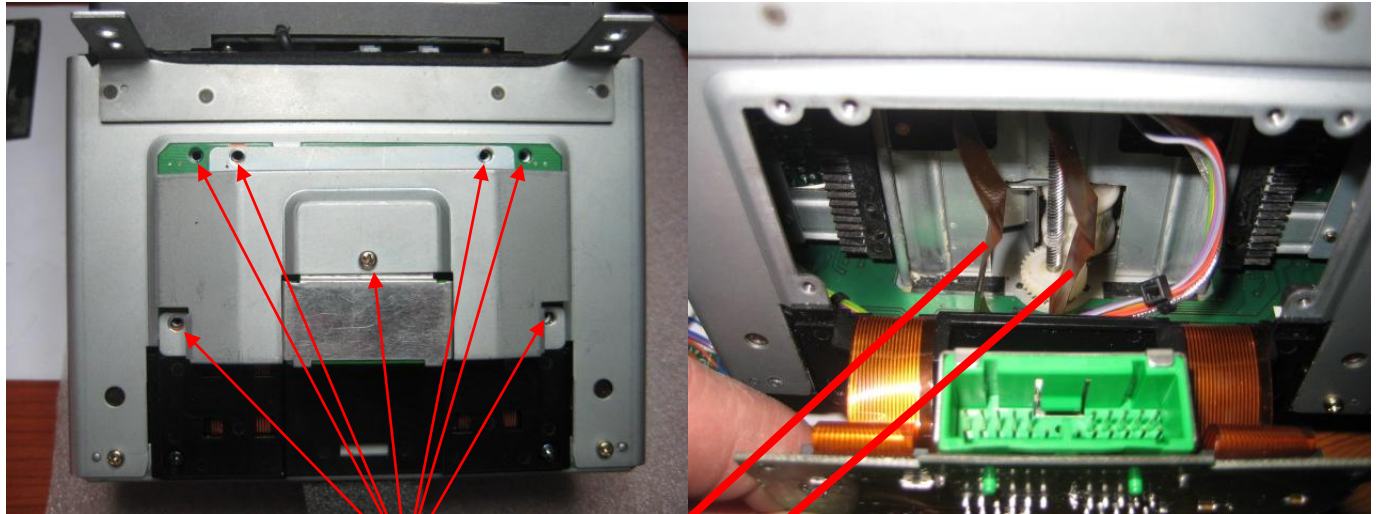


Take out the contact from the motor from the contact on the pc board.

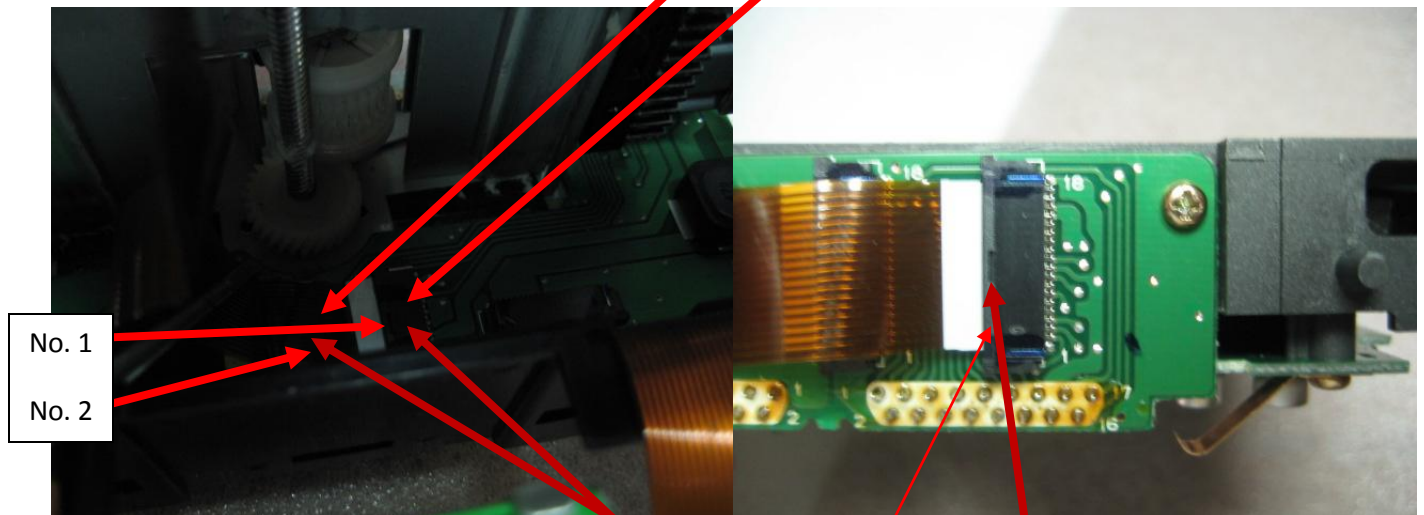
Use a Nokia phone charger to send the Display up as it is down when you took it out from the car. Or other 5V DC supply.



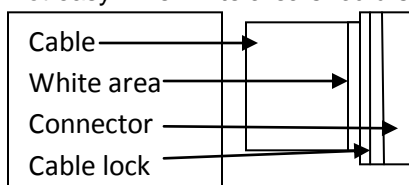
Take 2 small cable peaces and connect one to the negative (outside) of the Nokia charger and the other one to the hole on the middle of Nokia charger. Now you will have access to 6V DC which we will use to start the motor by connect the other end of those cables to the connector (just stick the cable into the connector) coming from the motor in the RTI which are a 9V DC motor. If the RTI do not move but the motor are running you have to change the position of the cable into the connector. When the RTI unit is in the top it will automatically stop in the right position but the motor will still be running as long as you have the Nokia charger connected. Take away the Nokia connector and the motor will stop.

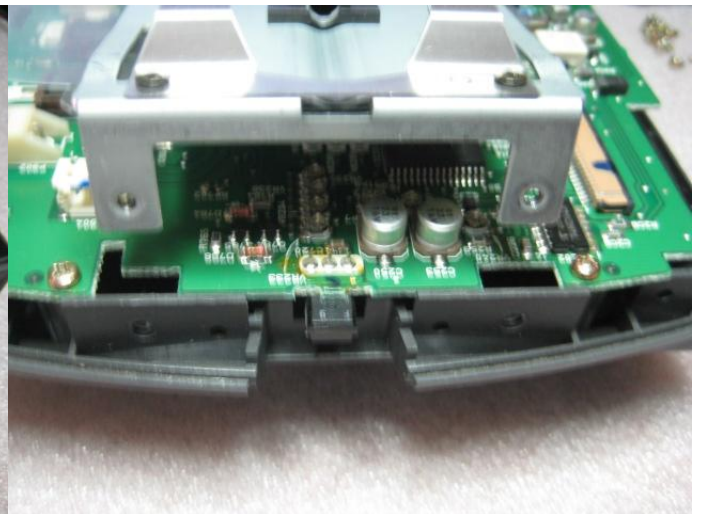
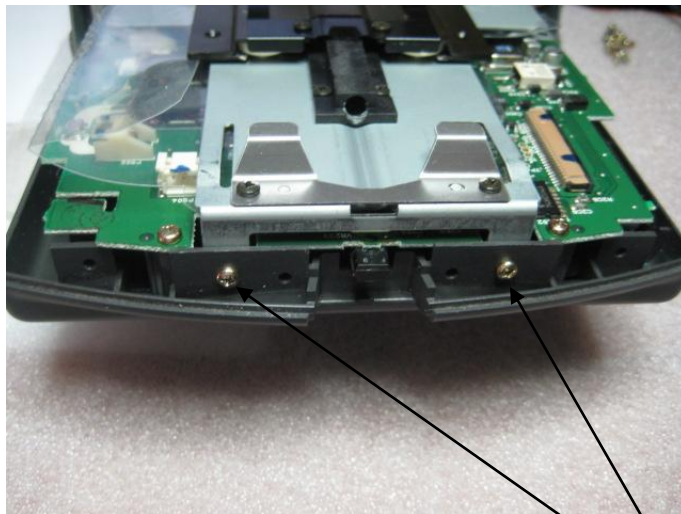


Take away the front cover (7 screws).

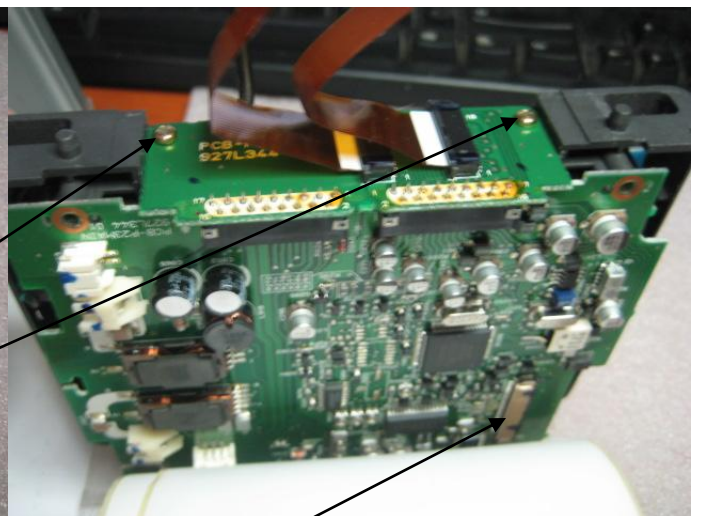
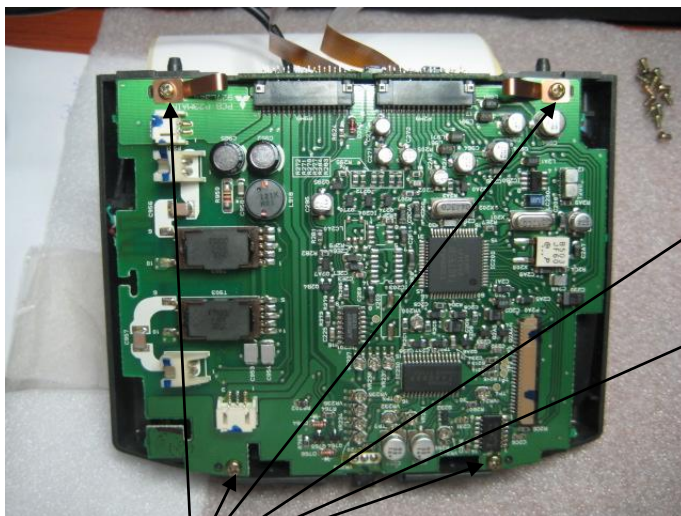


Behind the pc board and down you can see 2 connectors, take a small screw driver and bend up the connector (place the screw driver in the middle of the connector in the split, where the arrow shows and bend/screw carefully to the left and right until you see the connector is opening) and take out the ribbon cables. Be very carefully so you do not damage the cables or the connectors. When you put this cable back start with number 1 then number 2 and use a small screw driver to “steer” the cable together with you use your hand to push the cable into its place, then you push back the lock for the connector with a screw driver. Make sure the cable has gone all the way in and are **90 degree** towards the connector. It is not easy. The white area should show ca. 2mm outside connector before you push back the “lock”.

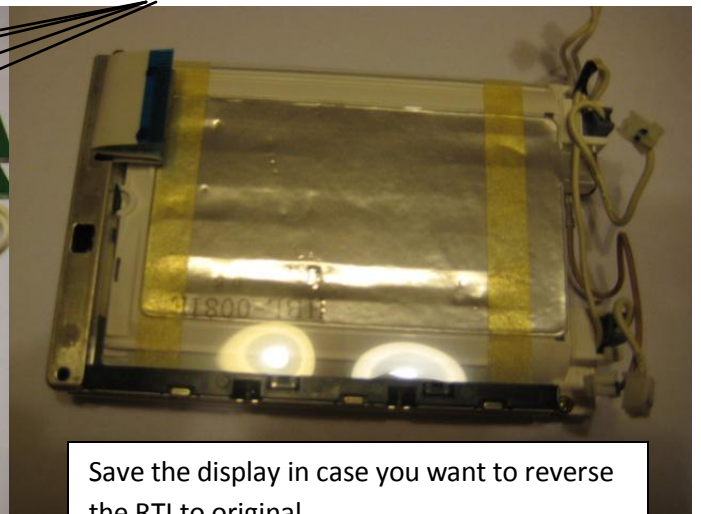
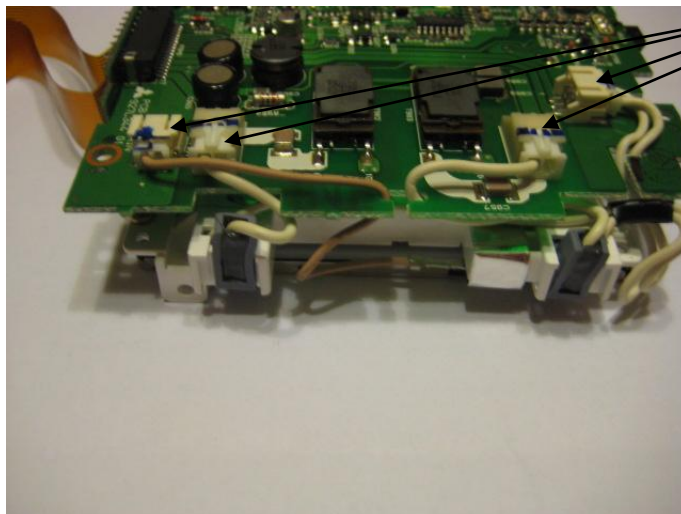




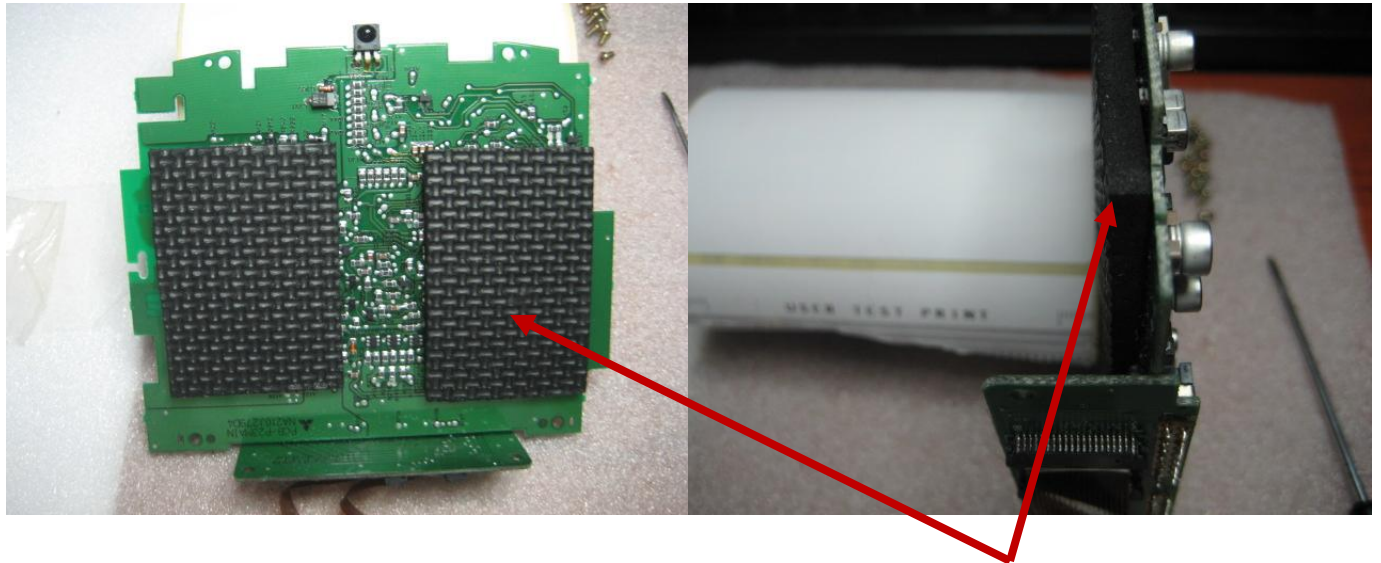
Take away the 2 screws holding the plastic cover over the display and open separate the back side from the front side of the plastic cover. It will go apart in the bottom and then you have to lift up the back part to get it separated from the front part. Then take away the 2 screws holding the complete display. Now you can lift up and out the whole display unit.



Take out all screws holding the pc board and the display. And all the connectors to the display.



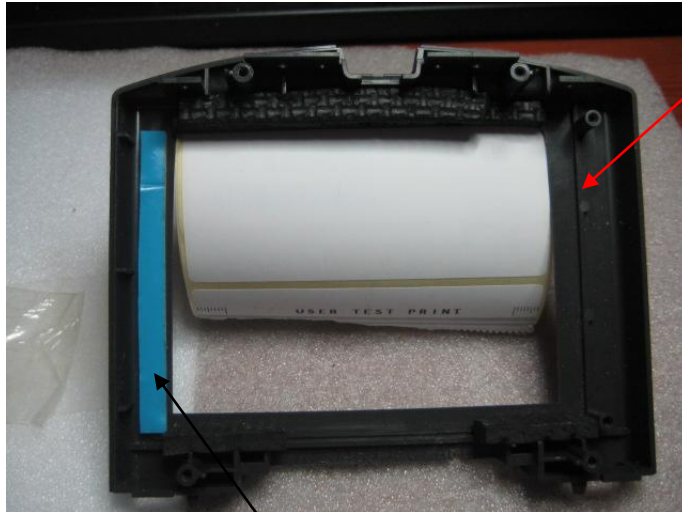
Save the display in case you want to reverse the RTI to original.



Now we have a clean pc board without any display. On the backside take 2 pcs. of rubber to make the distance (the thickness depends on which NAV you use) and for protection of the new NAV which will be in the place where we just took out the RTI display.

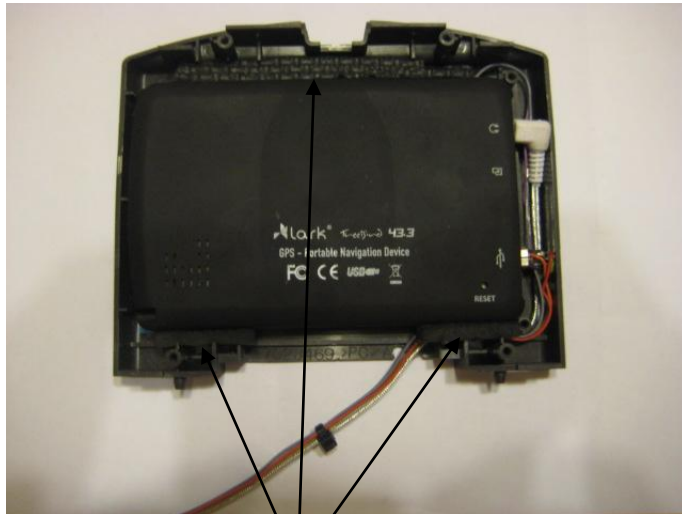


Unfortunately the original plastic front on the RTI is too thick for using together with touch screen NAV and you have to take it away, use a thin knife and carefully take away the original plastic front.



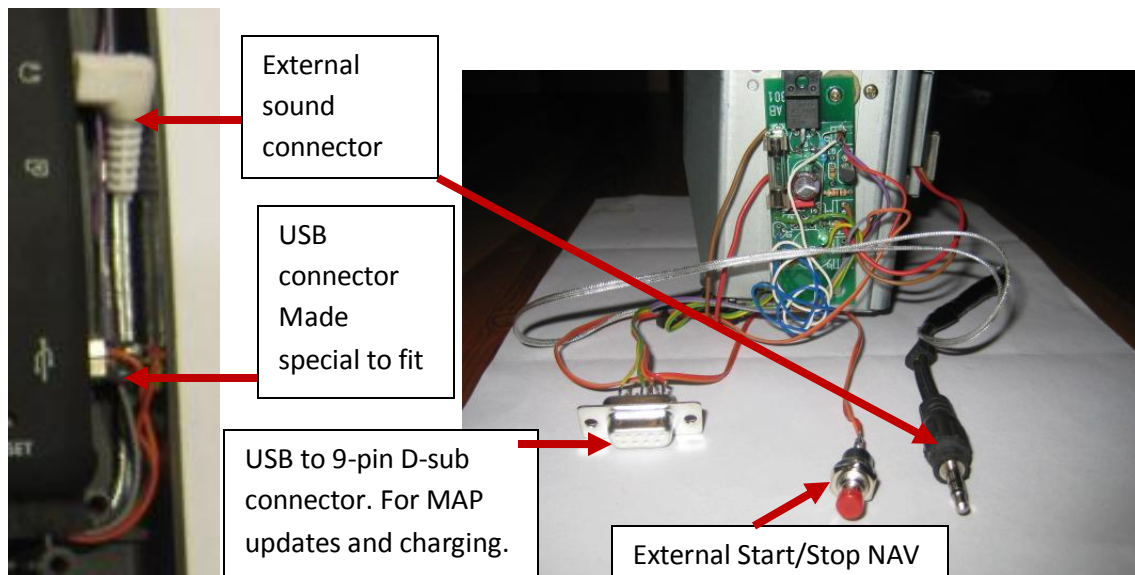
You have a small edge which makes a difference between left and right side of the plastic front. To get the NAV to be fitted good you have to compensate this difference by putting some rubber or double sided tape on the left side of the plastic front.

Put a small dubbelsided tape or some rubber with glue on one side in the left side of the plastic front. This we did because there is a level difference between the left and right handside.

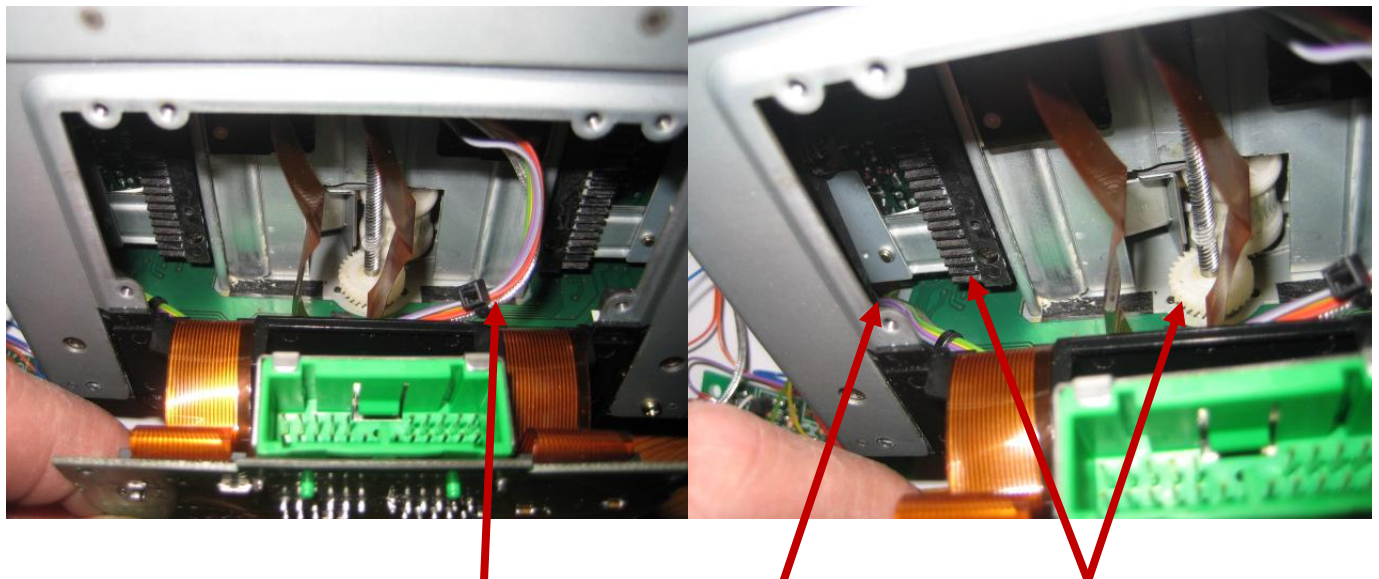


Then you put some rubber around the new NAV to fix it in right position. In our case we used a Lark Freebird 4,3 inch NAV. To get the black ram around we took an old black video cover and cut out the ram which we will glue on to the plastic front where the original plastic has been fitted.

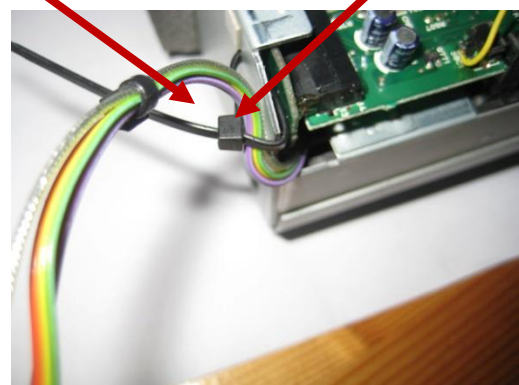
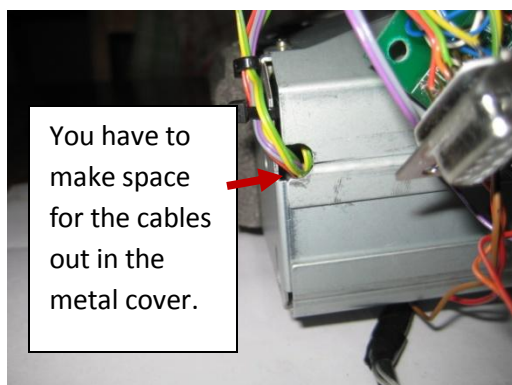




As you can see we have taken away the plastic for the USB connector due to it is very tight and also connected a plug for external sound as when everything is ready the sound will be very low from the original speakers inside the NAV. We first used standard USB cable but we got problem when the RTI unit has to go up and down and standard USB cable is too thick to easily move. We used flat cable instead which we have connected with a 9 pin D-sub outside the RTI module. We also have made one external Start/Stop NAV unit in case the NAV would be starting in wrong sequence when the RTI goes up or down, this button is only to have the opportunity to start or stop NAV manually.

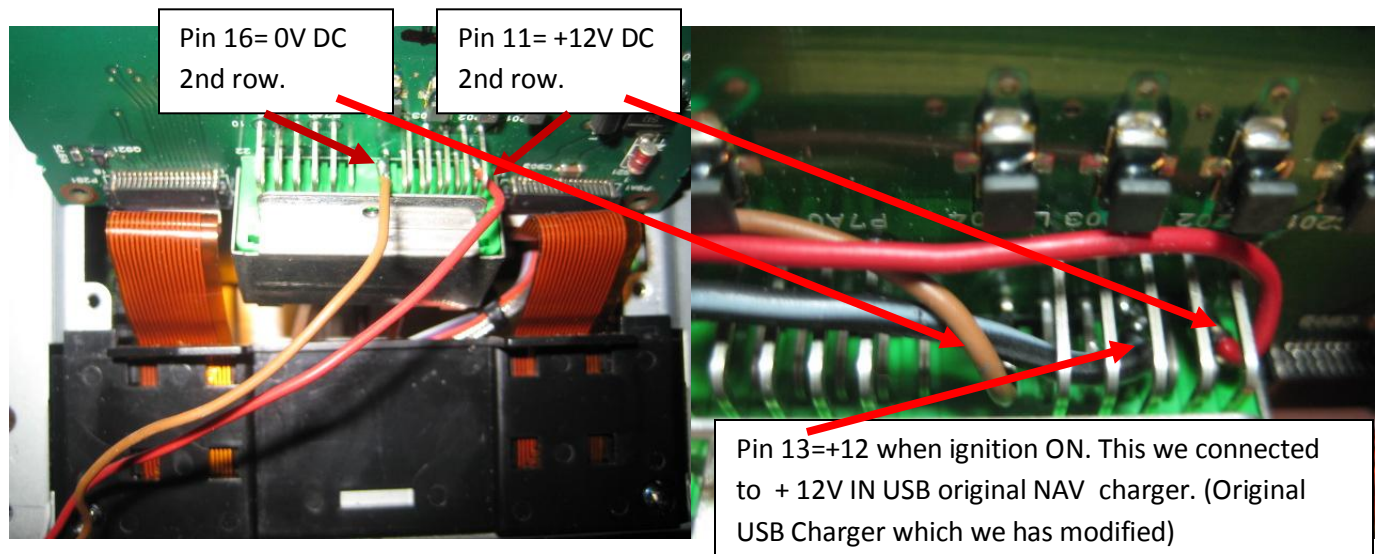


Be aware of that the cable has to be folded inside the RTI module when it is down and go free of the mechanical moving parts. We took out the cables in the left back corner and fasten it with a strap.

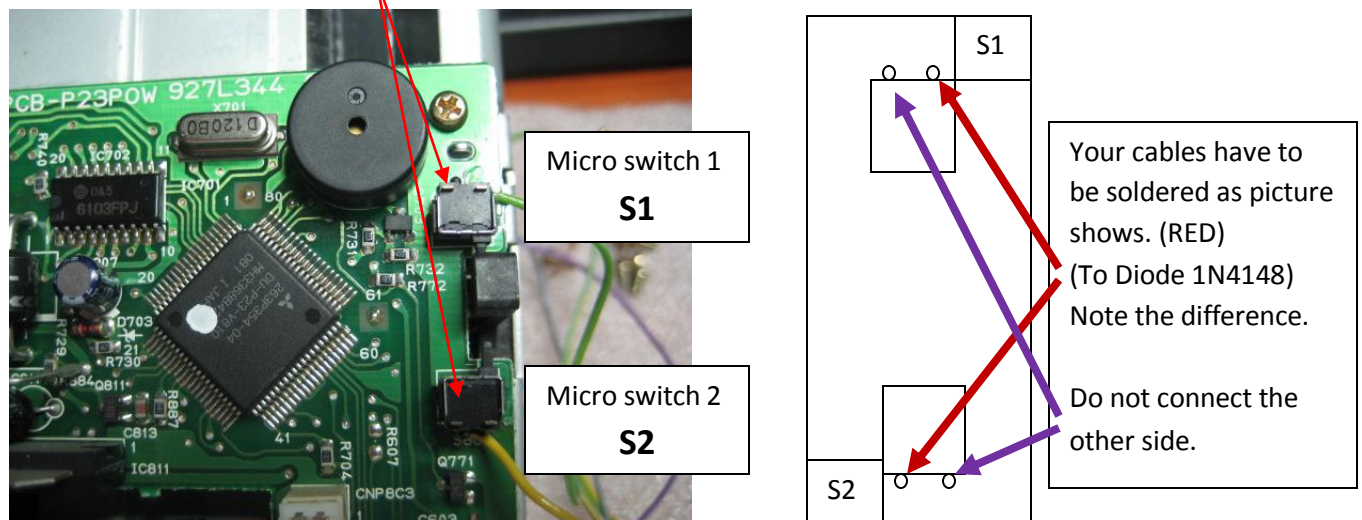


To get power +12V DC to the extra electronic we soldered 2 cables to the standard connector of the RTI.

Pin 11/12 is +12V DC from battery and Pin 15/16 is Gnd(0V DC). Due to the 12V DC is always connected we made a switch for disconnecting the power if we discovers that the unit would drain the battery, but normally it should not be any problem. The switch is only in case of during our test and you can have it or eliminate it. (The switch is not showing on the picture). We discovered later you do not need this switch.



To get the NAV to start and stop automatically when the RTI unit goes up and down you have to solder to cables to the 2 small micro switches which are on the RTI pc board.



The micro switch 1 is activated when the RTI is down and number 2 is activated when the RTI is Up.

For the "Push Bottom" in the your NAV you have to check which side of the bottom is connected to 0V.

You can do that with the cable wich you have soldered to the push bottom by connect one end to chassi of the USB, if the NAV starts it is not the one which is connected to 0V or ground. This one you have to connect to the new electronic board Diod D3 and the other which is 0V to 0V on the electronic board.

Before you close the cover of the back you have to connect the Nokia charger and let the motor take the RTI display with your NAV to down position. After you have assambled everything the unit should look like this.



When you want to operate the RTI from Volvo original buttoms or the Remote controller you have to remember that because you have taken away the original display you will not see anything so you have to learn:

Operating instructions Volvo original buttoms and Remote controller.

(This is if you have the CD still inside the RTI module in the back of the car)

First we will take the steering wheels buttoms.

1. Press "Enter"
2. The RTI will go up and the NAV starts.
3. Press "Back" one time.
4. Press the kross to move "down" 4 times, (has to be 4 times, else it will not work.)
5. Press "Enter"
6. The RTI will go down and the NAV will close automatically.

Second we will take the Remote controller.

1. Press "Power On"(Back)
2. The RTI will go up and the NAV starts.
3. Press "Back" one time.
4. Press the kross to move "down" 4 times, (has to be 4 times, else it will not work.)
5. Press "Enter"
6. The RTI will go down and the NAV will close automatically.

(If you take out all CD you just have to press "ENTER" for up and down of the RTI module)

If you comes out of sequence the RTI will not go down. To solve this you press "Back" several times and start from point 4 again. If you want to have the RTI to operate as soon as you starts the car you press "Enter" and then the RTI will go up and the NAV will start, the RTI will go down when you stop the car. Next time you starts the car the RTI will automatically starts together with NAV. In this mode you always have RTI/NAV automatically started when you starts the car. For modification of TV tuner to get external NAV Voice Guide look at: <http://www.nasab.com/Volvo/External Sound NAV-RTI Volvo Part One.pdf>

We wish you Good luck!

Now we will show you the electrical pc board and schema. You can use 12V DC version or the 5V DC version. Both is working, but we chosed the 5V DC model because we want to be sure not to get +12V DC into the RTI standard Electronic or the NAV by misstake, so if you want to be sure, use the 5V DC version. This electronic will make the NAV start when the RTI unit is going up and close the NAV automatically when the RTI unit goes down. For the external Audio Sound modification of the TV tuner for NAV you can find under. <http://www.nasab.com/Volvo/External%20Sound%20NAV-RTI%20Volvo%20Part%20One.pdf>

GA1247B	
Projekt	Dato
NAV-RTI	14-03-13
Nasab	Dra. No.
	14-301-1

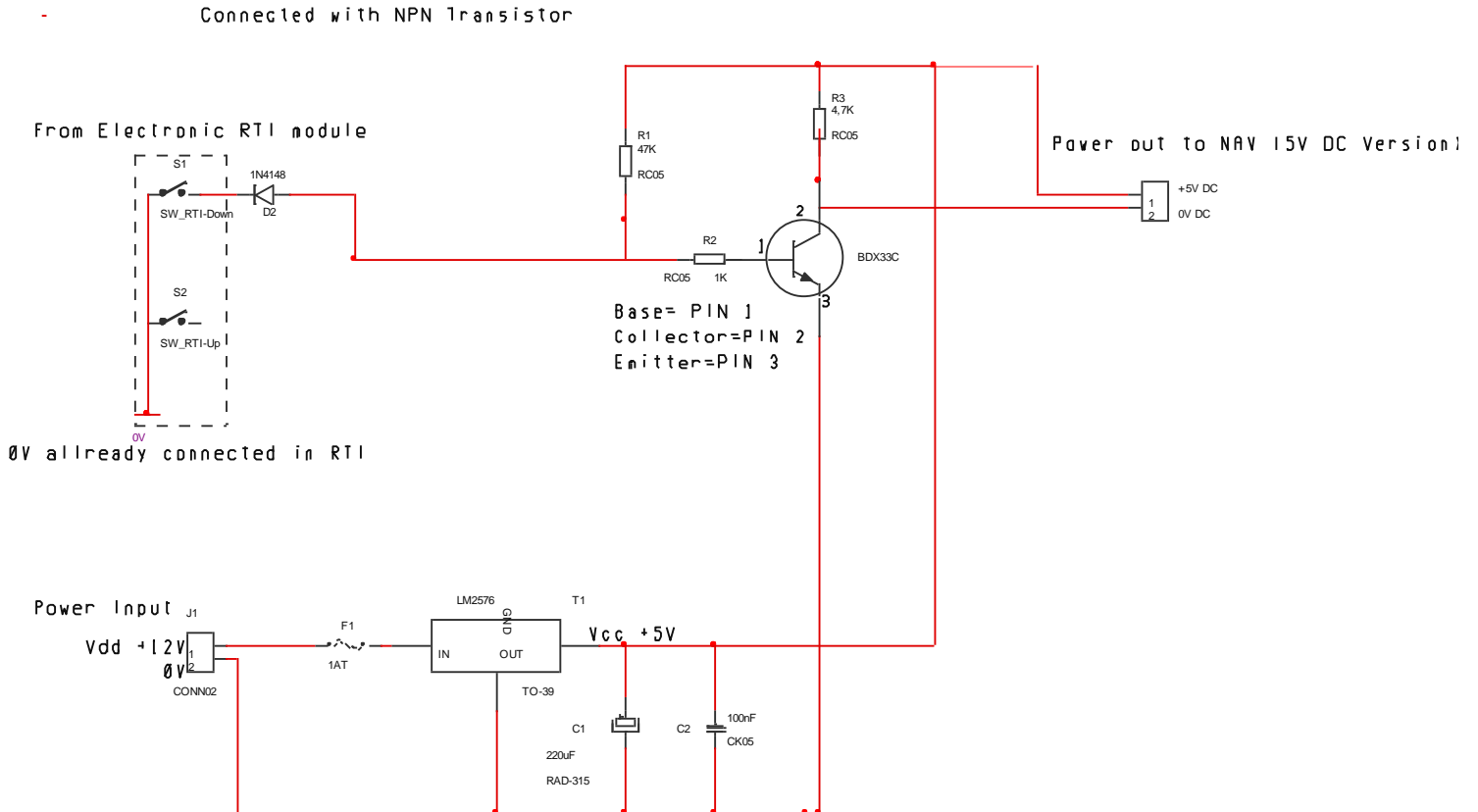
Electronic Schema NAV/RTI for NAV without Push Bottom 5V DC Version

(For NAV which starts automatically when power is connected)

This will automatically start the NAV when the RTI is **UP** and close the NAV when the RTI is **Down**

Pls. note the difference between NPN and PNP.

Connected with NPN Transistor (With S1 in RTI)



+12V DC from PIN 13 in RTI Connector

0V DC from PIN 16 in RTI Connector

As we have got some feedback with problem with the drawings we have made some changes.

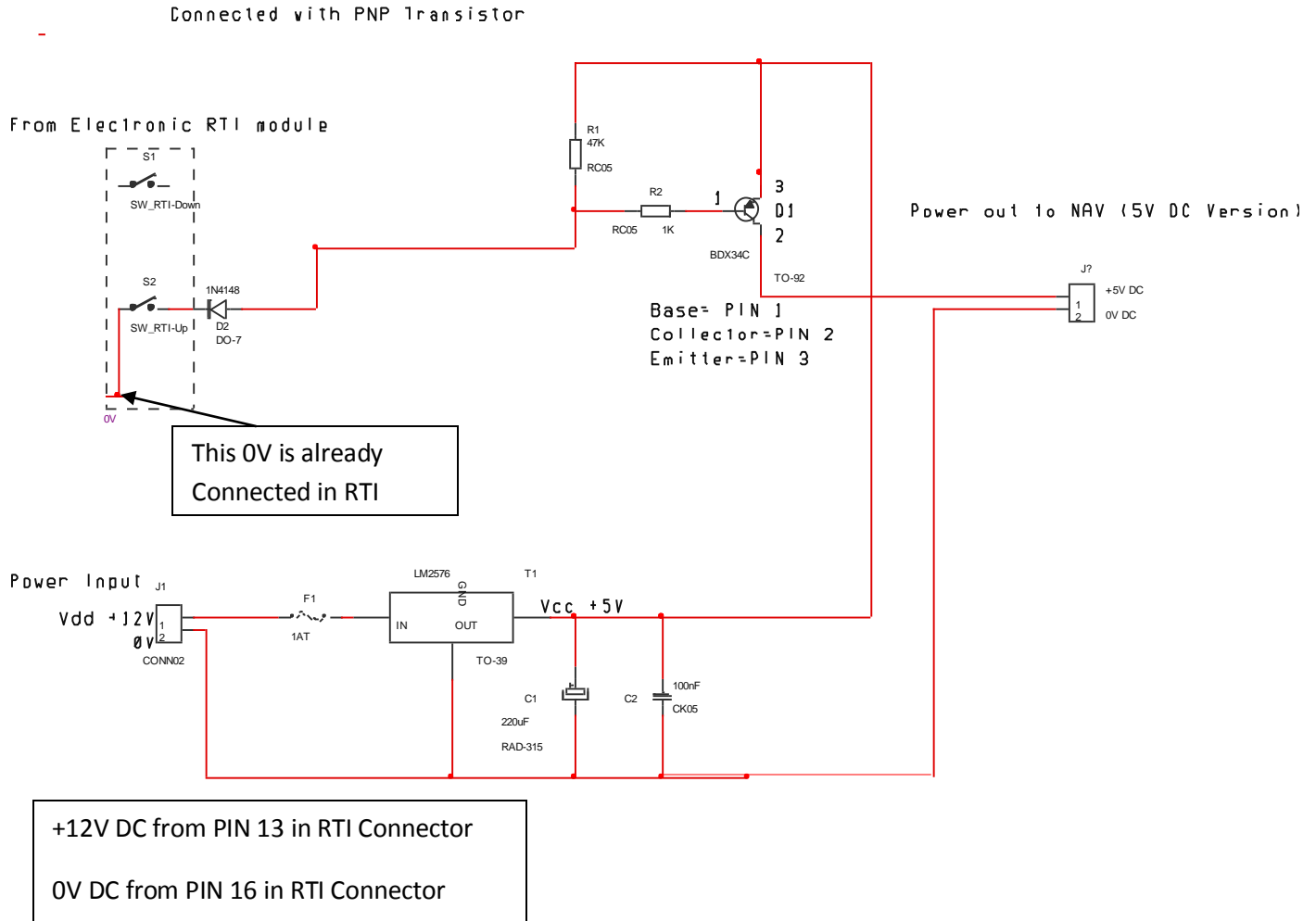
If you do not use the 5V DC converter you have to connect your NAV charger to Pin 13 and then the charger to your NAV. Normally all NAV's are not +12V DC but +5V DC. If your charger is of the type which has the transformer in the connector which is supposed to be fit into the cigarette lighter contact, you can disassemble the connector and take out the electronic which is inside and connect this to Pin 13 on the RTI connector just be sure you get +12V DC and 0V DC the right way Into your charger.

Electronic Schema NAV/RTI for NAV without Push Bottom 5V DC Version.

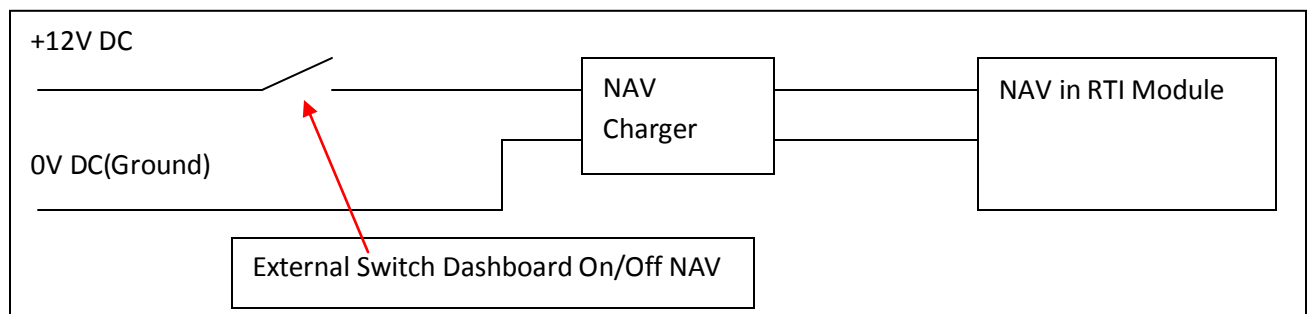
(For NAV which starts automatically when power is connected)

This will automatically start the NAV when the RTI is **UP** and close the NAV when the RTI is **Down**

Connected with PNP Transistor (With S2 in RTI)



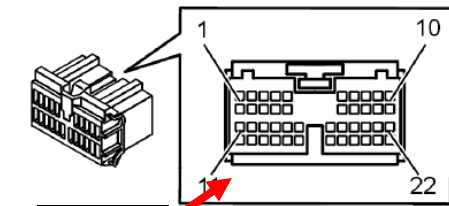
Or the simplest way is just make a switch somewhere to start your NAV after the RTI is UP.



Display (to RTI control module and "chassis")

Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#).

Display terminals J1-J22 correspond to terminals #1-#22 on the breakout box.



Display module terminal	Breakout box terminal	Signal type	Ignition on	Other
J1	#1	Colour signal (red), screen	Analogue signal when red colour is displayed	0.714 V p-p
J2	#2	Colour signal (green), display	Analogue signal when green colour is displayed	0.714 V p-p
J3	#3	Colour signal (blue), screen	Analogue signal when blue colour is displayed	0.714 V p-p
J4	#4	Synchronizing signal, TV	Digital signal	0-5 V
J5	#5	Screen ground, video signals	Ubat	-
J6	#6	Signal, display remote control	Digital signal	38 kHz carrier wave when the remote control is pressed
J7	#7	-	-	-
J8	#8	Screen ground, cable to the screen	Ulow	-
J9	#9	Video signal to display	Analogue signal	1 V p-p +/- 0.2 V
J10	#10	-	-	-
J11	#11	30-supply (power supply from battery)	Ubat	-
J12	#12	30-supply (power supply from battery)	Ubat	-
J13	#13	15 supply	Ubat	-
J14	#14	-	-	-
J15	#15	Ground (Measured to battery negative terminal)	Ulow	-
J16	#16	Ground (Measured to battery negative terminal)	Ulow	-
J17	#17	-	-	-
J18	#18	Serial bus from the control module	Digital signal	Half duplex, start-stop synchronizing, 2400 BPS
J19	#19	-	-	-
J20	#20	-	-	-
J21	#21	-	-	-
J22	#22	-	-	-

+12V to Special Electronic

+12V for Charging NAV (+12V when ignition is on.

0V to Special Electronic And to NAV charger.

Sunday, March 16, 2014

Some result of test:

For the past week we have been having this equipment installed in one of our Volvo V70 01 and the result has been very good, no problem with the electronic the NAV has been working as it should and the original bottoms on the steering wheel and the remote controller has been working fine, also the feature where you are using the NAV and you are on the road and you stops for filling gasoline and you shuts down the car, the RTI goes down smoothly and starts again when you start the car again. The result of this modification is very good so far and we will have a look at how to connect the sound to voice guide channel of the Volvo. The problem is there is no voice guide channel in the original RTI display connector and we have to go all the way back to the TV module in the back of the car to find a connector which have voice guide channel or to the radio module. Then you have the Melbus protocol to consider. But we will see if we can go around this as we have done with the RTI unit already. Would be nice to get the voice from the NAV to be sent over the voice guide channel or else we have to connect a separate speaker just for NAV. But that is the last solution we will take, first we will try to go around the Melbus protocol.

Why we done this:

1. We were tired of Volvo who had not made any maps for Eastern Europe.
2. As we have a factory in Poland and we cannot get any maps at all for Eastern Europe CD version, they have never made it, only for DVD RTI.
3. Maps for Western Europe inclusive Scandinavian not up to date and will never be.
4. Why have an RTI in a car you cannot use, better modify and use it.
5. And with this you can update the maps by USB and Internet.

The Audio NAV Voice Guide Sound modification to the TV tuner you can find on our web site:

<http://www.nasab.com/Volvo/External Sound NAV-RTI Volvo Part One.pdf>

To all of you who likes to do this we hope this guide have helped you.

Nasab International Corporation

Special Machines/Electronic Department.

Contact information if you wonder something: smed@nasab.com

Saturday, May 10, 2014

We have made some more opportunity to connect NAV together with RTI as there has been some question around this. Pls. see new drawings for +5V versions.

Also we has discovered the angle for NAV has to be adjusted with some rubber in the top due to it is hard to read the NAV when the sun shines.

Make the Angel different.

The angel should be a little bit more backwards due to it is hard to read the NAV when the Sun is shining.

Stripe of 2 or 3mm rubber along the top of the NAV will make the display in a better angel.

Sunday, 5 October, 2014,

Someone sent us an e-mail and told us "If you take out all CD you just have to press ENTER for up and down of the RTI module", Thanks to this clever guy.



External Sound for NAV using Voice Guide over Volvo speakers.

Where you have replaced RTI Display with NAV in Volvo.

(RTI CD Early model)

(Second Edition)

We will in this document show how you can use original Volvo sound system for the sound from the new NAV which you have replaced the RTI Display with.

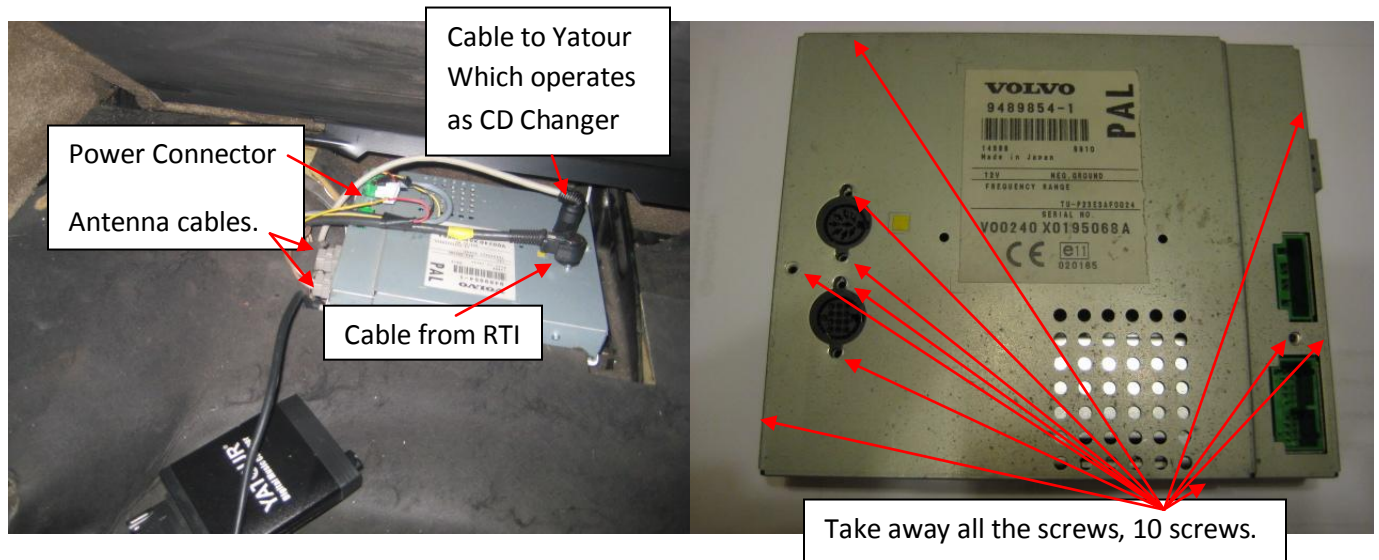
We will use the TV tuner box in the back of the car.

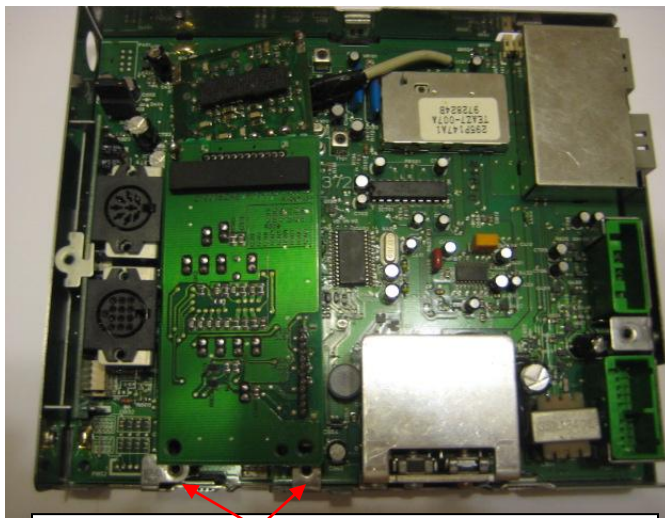
We first have to make some modification to the TV tuner to get the function we want.

After the first step of modification you can already use the external sound from NAV but only if you set up TV in the radio unit, then also you will have the function as if you had used the RTI bottoms on the steering wheel or remote control as the RTI will go up when you set up TV in the radio and the NAV will automatically start. But in this mode you cannot listen to some radio station or CD Changer or CD, because the RTI are in TV mode, but you will have voice guide sound from NAV.

So this is not enough and we have to be able to make some more modification so the Voice Guide Sound from NAV will override the Radio Channel, CD, Tape, CD Changer, Yatour Unit, IPOD unit and every other equipment you have connected to the Sound system of your Volvo.

The first step is to take out the TV Tuner from the car and take away the cover.



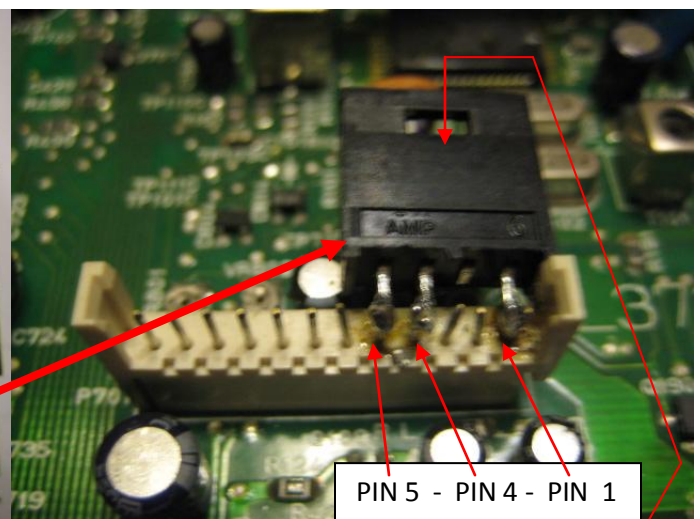
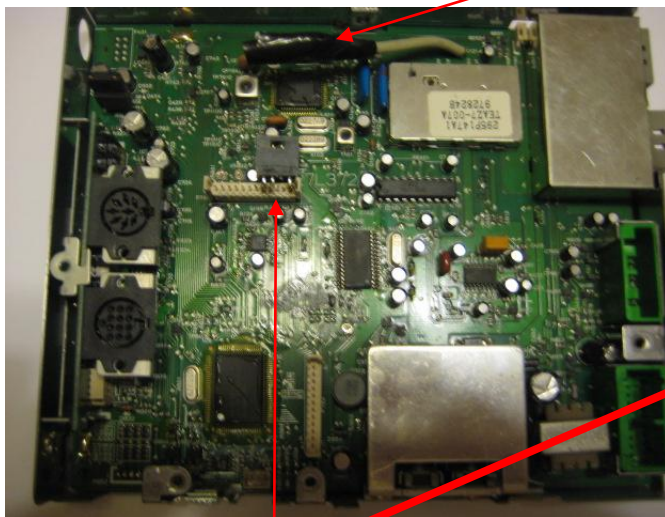


Take away 2 screws and take out the PC Board.



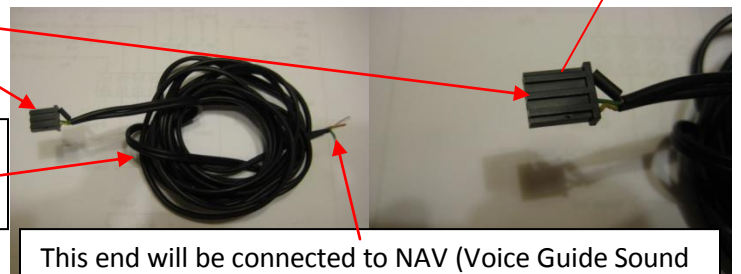
Save the PC Board together with the Display from RTI unit in case of reversing the unit to original.

Now we have the TV unit without AF. As you can see we had an extra PC Board on our unit, some are with and some are without. If you have with just cut the cables from the small PC Board going into the main Board and isolate the ends with some electrical tape.



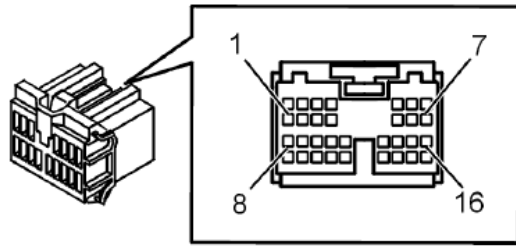
Then you take a connector and solder it to the connector PIN 1, 4 and 5. PIN 1 is signal ground, PIN 4 and PIN 5 is signal IN Left respective Right Channels. You can use whatever connector you prefer as long as it fits together with the pins in the connector on the main board, but you have to have the female side too as that is to be connected in this connector.

Cable coming from NAV Voice Guide Sound



This was the first part and now you have the opportunity to get sound out from NAV but only in TV mode.

This end will be connected to NAV (Voice Guide Sound out) in the dash board where the RTI unit is. The cable has to be placed under the carpet from the back of the car to the front.

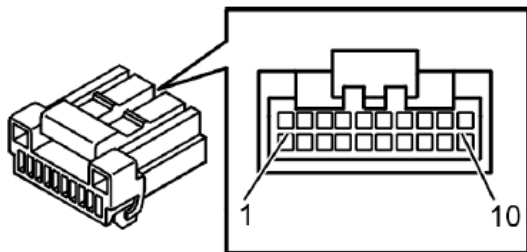


TV receiver (to RTI control module)

Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#).

TV receiver terminals M1-M16 correspond to terminals #25-#40 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
M1	#25	Video signal, TV	Analogue signal	1 V p-p +/- 0.2 V
M2	#26	Synchronizing signal, TV	Digital signal	0-5 V
M3	#27	-	-	-
M4	#28	-	-	-
M5	#29	-	-	-
M6	#30	-	-	-
M7	#31	30 supply	Ubat	-
M8	#32	Signal ground, TV signals	Ulow	-
M9	#33	Screen ground, TV signals	Ulow	-
M10	#34	-	-	-
M11	#35	-	-	-
M12	#36	-	-	-
M13	#37	Signal, remote control TV	Digital signal	33.3 kHz carrier wave when the remote control is pressed
M14	#38	-	-	-
M15	#39	Ground (Measured to battery negative terminal)	Ulow	-
M16	#40	-	-	-

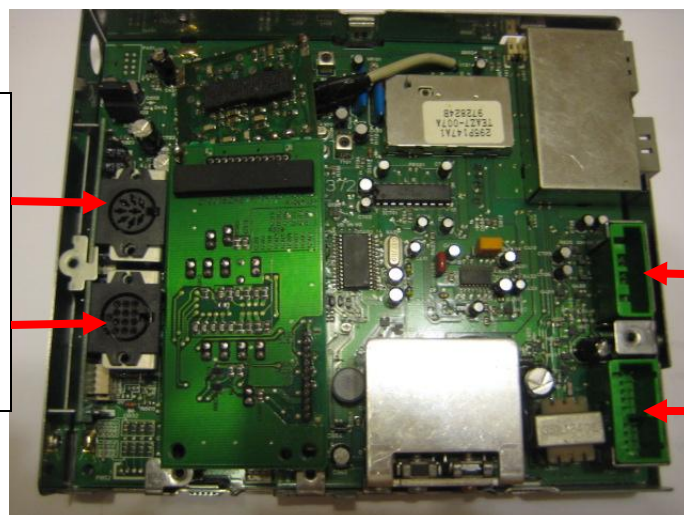


TV receiver (to reverse camera and video)

Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#) .

TV receiver terminals N1-N10 correspond to #47-#56 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
N1	#47	-	-	-
N2	#48	Power supply, rear camera	Ubat	-
N3	#49	Video signal, rear camera	-	-
N4	#50	Video signal ground, rear camera	Ulow	-
N5	#51	Video signal	-	-
N6	#52	Signal ground, video signals	Ulow	-
N7	#53	Left audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
N8	#54	Right audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
N9	#55	signal ground, audio	Ulow	-
N10	#56	-	-	-



Connector

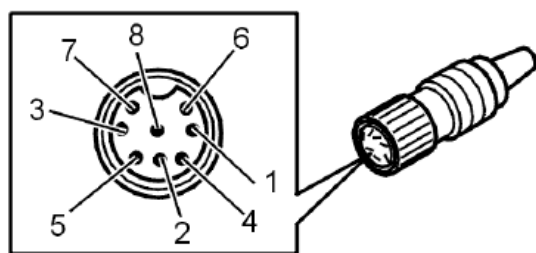
To RTI control module

To CD Changer, Yatour etc.

Connector

To reverse camera and video)

To RTI Control module



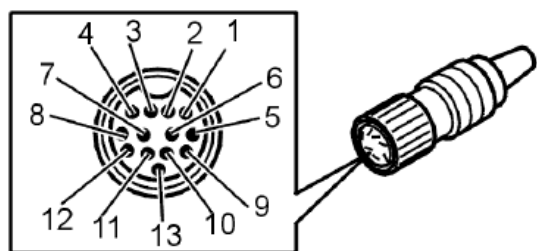
TV receiver (to RTI control module)

Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#).

TV receiver terminals O1-O8 correspond to terminals #16-#23 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
O1	#16	Clock signal to TV receiver	Digital signal	Melbus protocol
O2	#17	Signal ground, sound	Ulow	-
O3	#18	15 supply	Ubat	-
O4	#19	Data signal to TV receiver	Digital signal	Melbus protocol
O5	#20	Busy signal to TV receiver	Digital signal	Melbus protocol
O6	#21	Left audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
O7	#22	Right audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
O8	#23	Voice guide channel	Alternating current when there is sound to the loudspeaker (during voice guidance)	-
H		Screen ground, cable to audio unit	Ulow	-

TV receiver (to CD player)

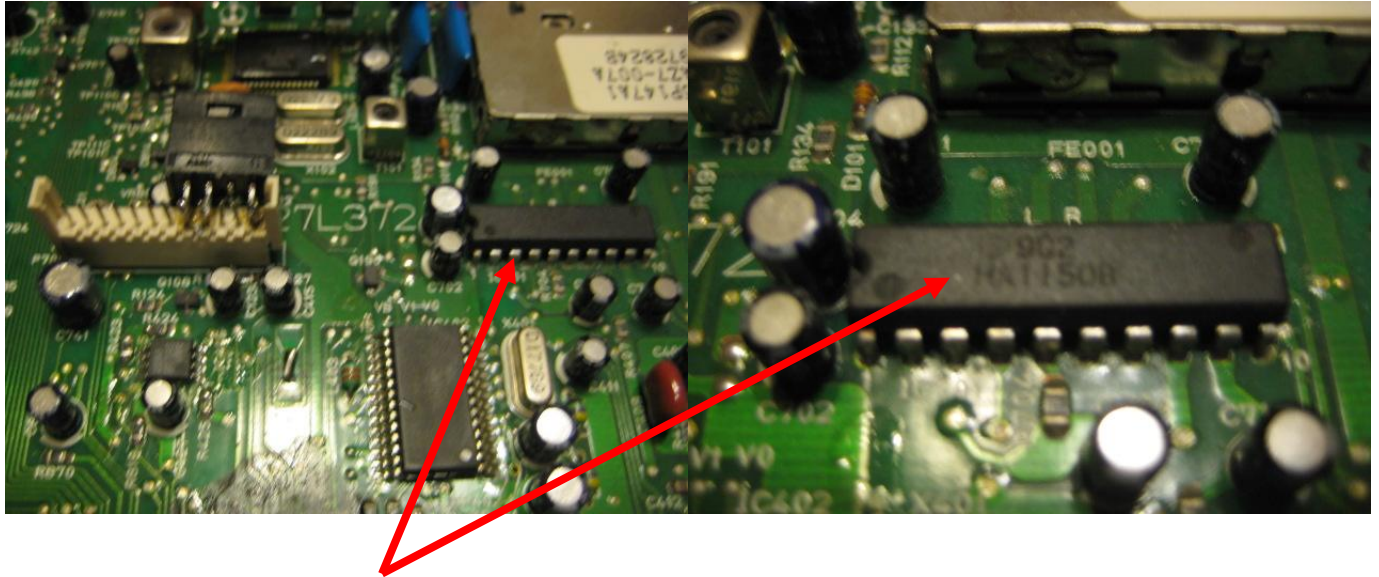


Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#) .

TV receiver terminals P1-P13 correspond to terminals #1-#13 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
P1	#1	signal ground	Ulow	-
P2	#2	Left audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
P3	#3	-	-	-
P4	#4	Right audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
P5	#5	-	-	-
P6	#6	Voice guide channel	Alternating current when there is sound to the loudspeaker (during voice guidance)	-
P7	#7	-	-	-
P8	#8	-	-	-
P9	#9	-	-	-
P10	#10	15 supply	Ubat	-
P11	#11	Busy signal to TV receiver	Digital signal	Melbus protocol
P12	#12	Clock signal to TV receiver	Digital signal	Melbus protocol
P13	#13	Data signal to TV receiver	Digital signal	Melbus protocol
H		Screen ground, cable to TV receiver	Ulow	-

Second Part



On the main board of the TV tuner there is an IC which is a Three Video Input, Three 2 channels Audio Input and Two Output circuits. The IC are HA11508 an Audio-Video Switch from Hitachi. This IC we will make some modification to and we will use the NAV and a small special made electronic we will make to set the switches the way we want without using Melbus Protocol and some other sophisticated programmable IC to communicate with it. This we will look into and publish as soon as we have solved it so everybody have a chance to make this modification without any special programming tools.

The Pdf file with schema over HA11508 can be found at our web site for download:

www.nasab.com/Volvo/datasheet-HA11508.pdf

This IC will even be of interest for those who try to connect some Video, Back camera etc. You can with some small electronic get it to serve your purpose. To get it to work another or your way you have to make some electronic between Pin 6, 8 and 10. This pin is control and mute pins and Volvo has put these to 0V. And we think they are operated from Melbus, but you can cut in the pc board the connection to pin 6 and 8 easily and let those 2 control signal together with the signal from Melbus be connected with some special electronic you make, by this you would have the opportunity to control this switch together with Melbus for setting up back camera or video without depend on the Melbus. But you do have to have knowledge of electronic and how to do it. But that we will take in another project.

We will also mention that this modification for the 4.3 inch RTI display to NAV can also be adapted for the wider Volvo Display as the mechanical parts are the same in the RTI Display and you can use a wider NAV, maybe with Video in, if so, maybe you should not take out the AF PC board from the Tuner, but solder the new small connector directly on the PC board contact and use the other connector on the

right side from the power connector to connect your Video or Back Camera. Then you can use this IC to setup the switches. But as we said it will be in another project.

For the time being we will use the TV mode.

Link to **Replacement of RTI Display Unit to NAV in Volvo (RTI CD Early model):**

<http://www.nasab.com/Volvo/NAV%20for%20RTI%20Volvo.pdf>

Tuesday, March 18, 2014

To use the IC switch for voice guide we have discovered without Melbus Protocol it will not work as long as we would try to use the over ride mode of the original NAV for sound, and this over ride is not in the TV tuner, only back camera, Video is operated in this IC switch, we have to go to the central unit of the RTI in the trunk to see if we can solve this for the NAV voice guide.

But we have been testing the TV mode and it works as follows.

If you start the RTI with the Navigation mode then you will not have the sound from the NAV in the speakers before you shift to TV in the radio module. If you then change on the radio to CD Changer or Radio or whatever the sound will shift to what the radio are showing, but you lose the NAV voice guide information. But the navigation is still working. Every time you want to listen to the voice guide you have to tune back the radio module to TV. If you start the RTI in TV mode, the NAV will start and you will have the NAV voice guide sound in the speakers. But as soon as you turn the radio to CD, CD Changer, Radio or whatever it will shut down the RTI and the NAV.

We also have discovered you have some background sound in the speakers because of the TV tuner. This sound is the sound you get on a normal TV old PAL system when you did not have any station locked. In Swedish we call it "Brus" sounds like "SSSSHHHHH". We have also discovered there is some high frequency from the NAV in the background. We will try to find out how we can get rid of this by some filter. Else the equipment works very well, no problem at all so far. Except you have to tune the radio to TV for the sound from NAV voice guide.

Updates:

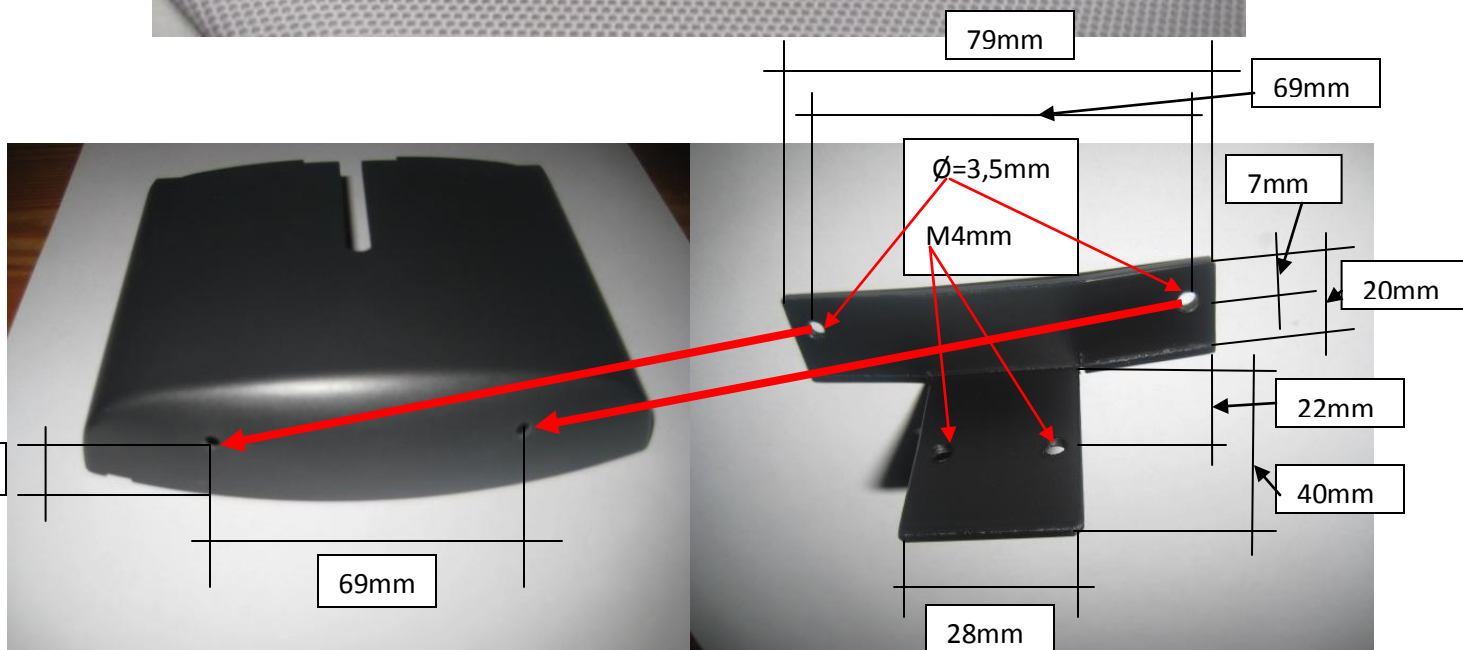
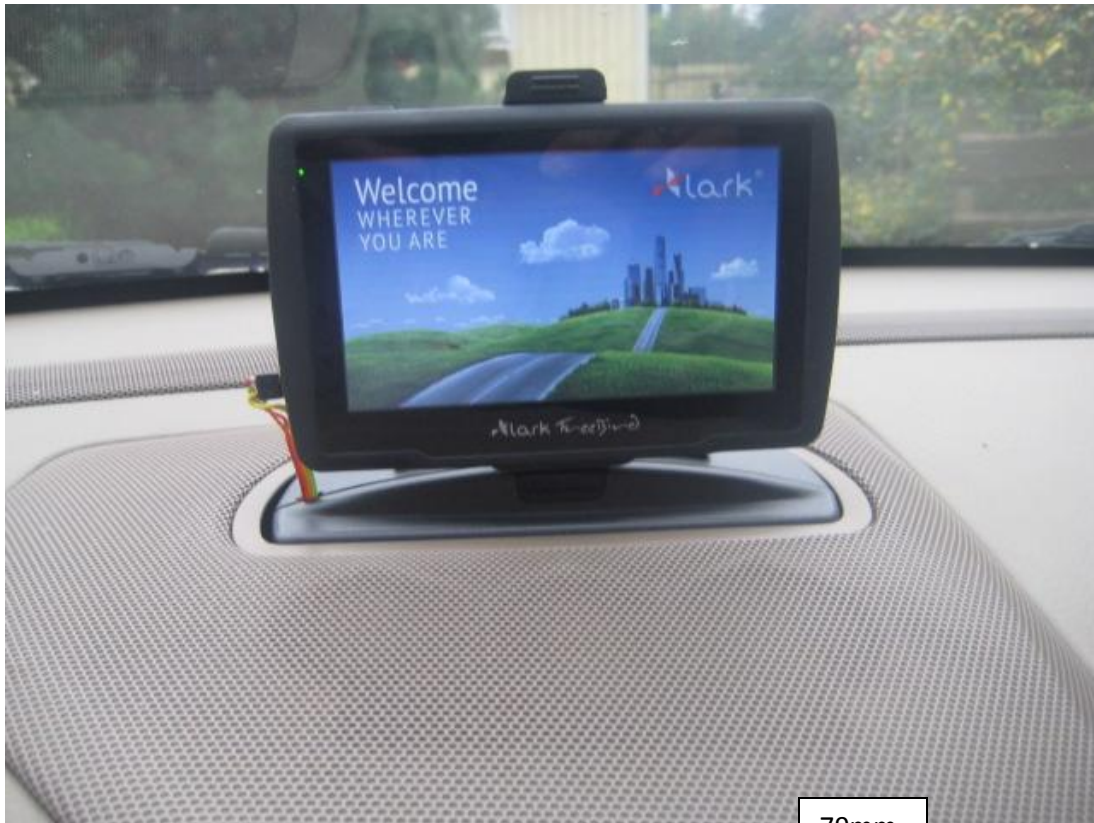
We got rid of the high frequency and the other back ground sound which we had in the speakers when we had sound from NAV true the TV tuner when we made a 0,75mm cable between the ground (0V) on our special NAV/RTI Electronic PC Board 4-900054 to the metal chassis on the RTI unit.

We will be back as soon as we have some more news on this topic.

Sunday, 5 October, 2014,

Someone sent us an e-mail and told us "If you take out all CD you just have to press ENTER for up and down of the RTI module", Thanks to this clever guy.

How to use RTI Display Unit as Back Camera with standard NAV on top in Volvo (RTI CD Early models)



This aluminum adapter we made to fasten the Standard NAV plastic holder.

We bent the metal to fit on the RTI plastic cover. How to disassemble the RTI, pls. see above in this document.



Modified USB which goes inside the RTI and connected to Pin 13=+12V ignition ON and

Pin 16=0V

Pls. see [Power](#)



Modified USB to fit inside the RTI when it goes up and down.

Standard cable to thick for going inside the RTI.

We will be back when we has connected a back camera to the TV unit in the trunk of the Volvo.